UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/710,472	11/10/00	SUGIMOTO	M 10873.600US0

023552
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MM91/0615

EXAMINER	
GONZALEZ, J	
ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 06/15/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)	
	09/710,472	SUGIMOTO ET AL.	
	Examiner	Art Unit	
	Julio C. Gonzalez	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-15 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-15 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 10 November 2000 is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1 .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other: .

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Piezoelectric element and mobile communication device using the same having nonparallel shear vibration.

Drawings

2. The drawings are objected to because in claim 1 it was disclosed that planes are not parallel (figure 4A, 4B), but in figure 4C, both planes are shown to be parallel. Correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant discloses in claim 1 that both principal planes are nonparallel and that both planes are rotated in different directions (claims 4, 5). How is it that in figure 4C, both planes are parallel to each other and do not seem to be rotated at all?

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Kasanami et al.

Kasanami et al discloses a piezoelectric element comprising a piezoelectric substrate, a pair of electrodes on a principal plane and second principal plane where shear vibration is nonparallel to a side wall of the piezoelectric substrate (see figure 21). Also, the piezoelectric element has the shape of an elongated rectangular solid (see figure 41).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kasanami et al in view of Yanagihara et al.

Kasanami et al discloses a piezoelectric element comprising a piezoelectric substrate, a pair of electrodes on a principal plane and second principal plane where shear vibration

is nonparallel to a side wall of the piezoelectric substrate (see figure 21). Also, the piezoelectric element has the shape of an elongated rectangular solid (see figure 41). However, Kasanami et al does not disclose that the piezoelectric element is composed of a certain crystal.

On the other hand, Yanagihara et al discloses for the purpose of decreasing undesired response waveform and suppressing the ripple within a certain frequency band, that the piezoelectric substrate is made of $LiTaO_3$ (column 1, lines 29).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design a piezoelectric element with two planes as disclosed by Kasanami et al and to make the piezoelectric material using lithium tantalate for the purpose of decreasing undesired response waveform and suppressing the ripple within a certain frequency band as disclosed by Yanagihara et al.

9. Claims 9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasanami et al in view Mandai et al.

Kasanami et al discloses a piezoelectric element comprising a piezoelectric substrate, a pair of electrodes on a principal plane and second principal plane where shear vibration is nonparallel to a side wall of the piezoelectric substrate (see figure 21). Also, the piezoelectric element has the shape of an elongated rectangular solid (see figure 41). However, Kasanami et al does not disclose the use of a ground electrode and that the piezoelectric element can be used for a mobile device.

On the other hand, Mandai et al discloses for the purpose of ensuring a predetermined and a resonant frequency and providing means for easily adjusting the frequency that a ground electrode is used in the device, and that the piezoelectric element is cut using a laser (column 2, line 25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design a piezoelectric element with two planes as disclosed by Kasanami et al and to use a ground electrode for the purpose of ensuring a predetermined and a resonant frequency and providing means for easily adjusting the frequency as disclosed by Mandai et al.

10. Claims 4,5,10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasanami et al in view of Yanagihara et al and Mandai et al and ordinary skill in the art.

Kasanami et al discloses a piezoelectric element comprising a piezoelectric substrate, a pair of electrodes on a principal plane and second principal plane where shear vibration is nonparallel to a side wall of the piezoelectric substrate (see figure 21). Also, the piezoelectric element has the shape of an elongated rectangular solid (see figure 41). However, Kasanami et al does not disclose that the piezoelectric element is composed of a certain crystal.

On the other hand, Yanagihara et al discloses for the purpose of decreasing undesired response waveform and suppressing the ripple within a certain frequency band, that the piezoelectric substrate is made of $LiTaO_3$ (column 1, lines 29).

However neither Yanagihara et al or Kasanami et al disclose the use of a ground electrode and that the piezoelectric element can be used for a mobile device.
On the other hand,, Mandai et al discloses for the purpose of ensuring a predetermined and a resonant frequency and providing means for easily adjusting the frequency that a ground electrode is used in the device, and that the piezoelectric element is cut using a laser (column 2, line 25).
Kasanami, Yanagihara and Mandai disclose the claimed invention except for the rotation of the planes. It would have been an obvious matter of design choice to make the planes rotate in the XY and YZ direction, since applicant has not disclosed that the rotation of the planes solve any stated problem or is for any particular purpose and it appears that the invention would perform equally well with any other rotation.

11. Claims 6-8 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasanami et al in view of Yanagihara et al and Mandai et al, ordinary skill in the art and Hermann.
Kasanami et al discloses a piezoelectric element comprising a piezoelectric substrate, a pair of electrodes on a principal plane and second principal plane where shear vibration is nonparallel to a side wall of the piezoelectric substrate (see figure 21). Also, the piezoelectric element has the shape of an elongated rectangular solid (see figure 41). However, Kasanami et al does not disclose that the piezoelectric element is composed of a certain crystal.

On the other hand, Yanagihara et al discloses for the purpose of decreasing undesired response waveform and suppressing the ripple within a certain frequency band, that the piezoelectric substrate is made of $LiTaO_3$ (column 1, lines 29).

However neither Yanagihara et al or Kasanami et al disclose the use of a ground electrode and that the piezoelectric element can be used for a mobile device.

On the other hand, Mandai et al discloses for the purpose of ensuring a predetermined and a resonant frequency and providing means for easily adjusting the frequency that a ground electrode is used in the device, and that the piezoelectric element is cut using a laser (column 2, line 25).

However, neither Kasanami, Yanagihara or Mandai disclose the ratio of the width versus thickness of the piezoelectric element.

On the other hand, Hermann discloses for the purpose of providing a strong piezoelectric element and not to have a critical dependency on thermal characteristics that the width to thickness ratio is between 1.5 and 5 (column 1, lines 55-58).

Kasanami, Yanagihara, Mandai and Hermann disclose the claimed invention except for the rotation of the planes. It would have been an obvious matter of design choice to make the planes rotate in the XY and YZ direction, since applicant has not disclosed that the rotation of the planes solve any stated problem or is for any particular purpose and it appears that the invention would perform equally well with any other rotation.

Also, it would have been obvious to one having ordinary skill in the art at the time the invention was made to design a piezoelectric element with two planes as disclosed by Kasanami et al and to make the piezoelectric material using lithium tantalate for the

purpose of decreasing undesired response waveform and suppressing the ripple within a certain frequency band as disclosed by Yanagihara et al and to use a ground electrode for the purpose of ensuring a predetermined and a resonant frequency and providing means for easily adjusting the frequency as disclosed by Mandai et al and to use a certain width to thickness ratio for the purpose of providing a strong piezoelectric element and not to have a critical dependency on thermal characteristics as disclosed by Hermann.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julio C. Gonzalez whose telephone number is (703) 305-1563. The examiner can normally be reached on M-F (8AM-5PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

NESTOR RAMIREZ
SUPERVISORY PATENT EXAMINER
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Jcg

June 12, 2001